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Too small to do it all? A meta-analysis on the relative relationships of exploration, exploitation, and ambidexterity with SME performance

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ABSTRACT

We tailor theory on the relative performance implications of exploration, exploitation, and ambidexterity to the unique characteristics of small and medium-sized enterprises (SMEs). First, as SMEs' limited resources make it unclear whether ambidexterity is superior to exploration or exploitation in SMEs, we investigate their relative effects on SME performance. Second, as SMEs' resource and particularly knowledge constraints make property rights protection (PRP) pertinent to these firms, we examine PRP as a moderator. Consistent with our hypotheses, meta-analytical evidence from 5,488 SMEs across 34 studies suggests that: (1) ambidexterity has a less positive relationship with SME performance than both exploration and exploitation and (2) PRP decreases the positive relationship between exploration and SME performance. Unexpectedly, PRP decreases the positive relationship between exploitation and SME performance. Building on our findings, we develop a roadmap for SME-specific research, focusing on sequential switching between exploration and exploitation and contingency factors of the direct relationships.

1. Introduction

Ambidexterity (Tushman & O'Reilly, 1996) encompasses a firm's ability to simultaneously engage in *exploration* (i.e., 'experimentation with new alternatives') and *exploitation* (i.e., 'refinement and extension of existing competences, technologies, and paradigms') (March 1991, p. 85). In investigating how exploration, exploitation, and ambidexterity affect firm performance, the existing literature makes three primary inferences: first, overall, all three have positive implications for firm performance (Junni, Sarala, Taras, & Tarba, 2013; Mathias, McKenny, & Cook, 2018). Second, prominent theorizing suggests that ambidexterity generally leads to better performance than a focus on either exploration or exploitation (e.g., Tushman & O'Reilly, 1996). Third, how exploration, exploitation, and ambidexterity influence performance is context-dependent, as the associations vary by firm- (Belderbos, Faems, Leten, & Looy, 2010; Mathias et al., 2018) and environmental-level (Gatti, Volpe, & Vagnani, 2015; Luger, Raisch, & Schimmer, 2018; Mueller, Rosenbusch, & Bausch, 2013) circumstances. However, as the majority of the literature focuses on larger firms, it remains unclear to what extent the existing knowledge applies to small and medium-sized enterprises (SMEs).

The relationships of exploration, exploitation, and ambidexterity with performance are peculiar in SMEs for at least two reasons. First, although there is general agreement that all three positively affect SMEs' performance (Arzubiaga, Maseda, & Iturralde, 2019; Lubatkin, Simsek, Ling, & Veiga, 2006), it remains unclear whether ambidexterity is more beneficial to SMEs than a focus on either exploration or exploitation. Successful ambidexterity often requires distinct organizational architectures for exploration and exploitation (O'Reilly & Tushman, 2008). Given the high costs of maintaining such distinct architectures, it may be more advantageous for resource-constrained SMEs to focus on either exploration or exploitation (O'Reilly & Tushman, 2013). Indeed, focusing is often highly successful in SMEs, with some SMEs consistently engaging in exploration and disrupting the status quo with radically new ideas (Rosenbusch, Brinckmann, & Bausch, 2011), and others continually exploiting specific niches (K. S. Lee, Lim, & Tan, 1999). Conflicting empirical evidence echoes the lacking theoretical clarity: while some studies suggest that ambidexterity is superior to exploration and exploitation in SMEs (e.g., McDermott & Prajogo, 2012), others find no support for the notion that ambidexterity is beneficial to such firms (e.g., Bierly & Daly, 2007). Overall, this ambiguity engenders concerns that SMEs may benefit more from a focus on either exploration or

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exploitation (Turner, Swart, & Maylor, 2013).

Second, following from our prior argument, it is unclear under what boundary conditions exploration and exploitation become more or less beneficial for SMEs. In particular, while past SME research has shed light on firm-level (McDermott & Prajogo, 2012) and industry-specific environmental-level moderators (Bierly & Daly, 2007), knowledge on institutional environmental-level influences is surprisingly sparse in the SME context. This omission is problematic as institutional influences especially affect SMEs (Maekelburger, Schwens, & Kabst, 2012). Of such institutional factors, particularly country-level property rights protection (PRP) is an important boundary condition in our domain. Resource-constrained SMEs are highly susceptible to imitation (Bierly & Daly, 2007), making the prevention of imitation through country-level PRP vital to them. Country-level PRP enables SMEs to continuously utilize their idiosyncratic advantages without losing their competitive edge due to imitation from competitors (Teece, 1986). However, country-level PRP is a double-edged sword for SMEs: while PRP prevents the imitation of their competitive advantages, it also hinders knowledge spillovers (Acs, Braunerhjelm, Audretsch, & Carlsson, 2009; Gangopadhyay & Mondal, 2012). The prevention of knowledge spillovers through PRP is problematic for SMEs because they frequently face knowledge limitations and are often unable to invest heavily into new knowledge (Moilanen, Østbye, & Woll, 2014), which is critical for the success of exploration (Raisch, Birkinshaw, Probst, & Tushman, 2009). Overall, the two conflicting mechanisms lead to considerable ambiguity, constraining what we know about how PRP influences the relationships of exploration and exploitation with SME performance.

The present paper pursues three research aims. First, we develop theory explaining the relative effect sizes of the relationships of exploration, exploitation, and ambidexterity with SME performance. Our core argument is that, due to SMEs' limited resources, engaging in ambidexterity will be less beneficial for SMEs than focusing on either exploration or exploitation. Second, we theoretically derive how country-level PRP (through prevention of imitation and of knowledge spillovers) moderates the relationships of exploration and exploitation with performance in SMEs. To validate our theorizing related with both of these research aims, we meta-analyze findings from 5,488 SME observations nested in 34 independent studies and draw on data from 15 different countries for our moderator analysis. Third, meta-analysis provides a systematic assessment of a research field's current state (Rosenbusch, Gusenbauer, Hatak, Fink, & Meyer, 2019). In turn, our meta-analytical evidence allows us to develop a detailed roadmap for future research in this important area of scholarly inquiry.

We offer three contributions to extant research. First, we contribute to reducing diverging theoretical arguments and inconclusive empirical findings by examining the relative effect sizes of the relationships of exploration, exploitation, and ambidexterity with firm performance specifically in SMEs. While existing meta-analytical evidence documents the effects of exploration, exploitation, and ambidexterity on firm performance on firms of all sizes (Enke & Bausch, 2013; Junni et al., 2013; Mathias et al., 2018; Mueller et al., 2013; Shi, Su, & Cui, 2020), only Mathias (2014) theorizes that ambidexterity is superior to exploration and exploitation, but finds no support for this hypothesis in a sample integrating firms of all sizes. We advance the aforementioned literature with a novel perspective on how ambidexterity affects firm performance relative to exploration and exploitation in the specific context of SMEs, where the topic is particularly pertinent due to SMEs' limited resources.

Second, we advance existing knowledge by theoretically establishing and empirically validating the moderating influence of PRP on the relationships between exploration, exploitation, and SME performance. Extant literature expects country-level PRP to increase particularly the effect of exploration on performance by preventing imitation (Lavie, Stettner, & Tushman, 2010), while disregarding its opposing influence of knowledge spillover prevention. We argue that, in the context of SMEs, it is vital to consider *both* mechanisms to understand how country-level PRP influences the direct relationships. By integrating such a SME-specific environmental-level context factor, our study goes beyond prior meta-analyses (e.g., Junni et al., 2013; Mathias et al., 2018; Mueller et al., 2013) that investigate the role of environmental-level and firm-level moderators without considering the peculiarities of SMEs.

Third, we contribute to the literature by systematically taking stock of the performance implications of exploration, exploitation, and ambidexterity in SMEs by means of a meta-analysis. Beyond the more general advantages of performing a meta-analysis (e.g., reducing conflicting findings (Hedges & Olkin, 1985) and the examination of a moderator not originally considered by the primary studies (Mueller et al., 2013)), the results from our analysis serve as a starting point for deriving of a roadmap for future research with a specific focus on SMEs. More specifically, building on the notion of punctuated equilibrium (Tushman & Romanelli, 1985), we discuss how SMEs may benefit from sequentially switching between exploration and exploitation instead of engaging in ambidexterity (e.g., Kang & Kim, 2020; Mavroudi, Kesidou, & Pandza, 2020). Moreover, we highlight the importance for future research to consider the role of other potential contingency factors regarding the relative performance implications of exploration, exploitation, and ambidexterity in SMEs at the environmental-, firm-, and individual-level.

2. Background literature

Exploration and exploitation are defined along two dimensions: their relatedness to extant products, services, and knowledge and their relatedness to extant markets (Mueller et al., 2013). Exploration has a low relatedness to extant paradigms or markets and opens new trajectories for the firm. In contrast, exploitation has a close relation to the firm's present paradigms or markets and moves along existing trajectories. We follow extant research (e.g., Birkinshaw & Gupta, 2013) and conceptualize exploration and exploitation as distinct choices and not as endpoints of a continuum. Ambidexterity is the firm's ability to simultaneously explore and exploit (Tushman & O'Reilly, 1996).

Exploration, exploitation, and ambidexterity all generally improve firm performance. Exploration enhances firm performance by (a) creating new opportunities and (b) enabling firms to target new markets (He & Wong, 2004; Mueller et al., 2013). Exploitation improves firm performance through (a) refinement and variance reduction and (b) further penetration of the firm's existing markets (He & Wong, 2004; Mueller et al., 2013). Ambidexterity fosters firm performance through (a) combining and (b) balancing exploration and exploitation (Cao, Gedajlovic, & Zhang, 2009; He & Wong, 2004; March 1991). Combining the two allows firms to harvest synergies beyond the singular influences of exploration and exploitation. Balancing shields firms from the adverse effects of over-exploration and over-exploitation. However, achieving successful ambidexterity is far from trivial as exploration and exploitation make use of distinct organizational architectures: exploration is associated with improvisation, autonomy, and loosely coupled systems, while exploitation is linked to routinization, bureaucracy, and tightly coupled systems (He & Wong, 2004; Koryak, Lockett, Hayton, Nicolaou, & Mole, 2018). Scholars suggest two primary ways for firms to engage in ambidexterity (Fourné, Rosenbusch, Heyden, & Jansen, 2019): (1) by establishing *distinct units* for exploration and exploitation (Tushman & O'Reilly, 1996) or (2) by creating a supportive organizational context which allows ambidexterity to occur *within a single unit* (Gibson & Birkinshaw, 2004).

As SMEs are not merely smaller versions of large firms (Shuman & Seeger, 1986), extant knowledge does not necessarily apply to them. First, SMEs only have limited resources (e.g., Eggers, 2020), making the additional strain ambidexterity places on them considerable (De Clercq, Thongpapanl, & Dimov, 2014). Second, SME leadership tends to have fewer formal management structures, decision-making routines and information processing systems (Kiss, Fernhaber, & McDougall-Covin, 2018). Consequently, the complexities of ambidexterity may burden SME managers and employees particularly strongly. Third, knowledge

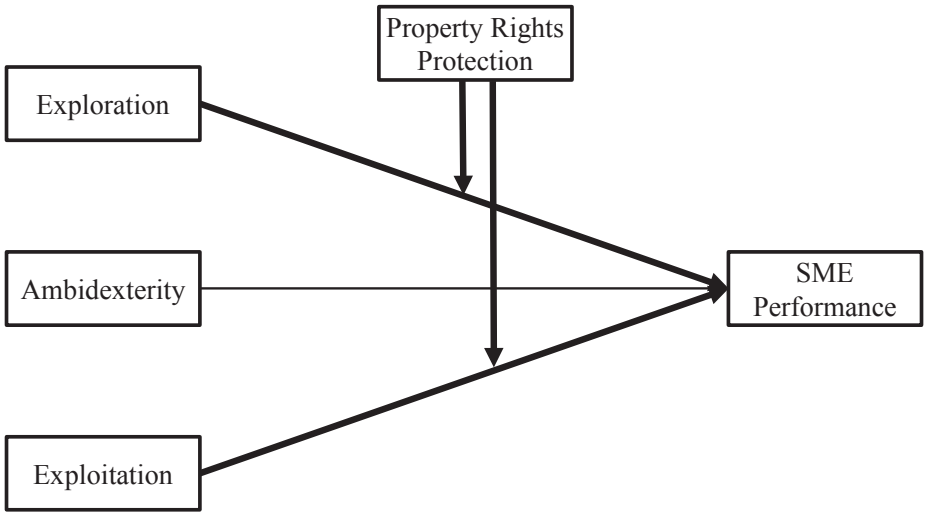

Fig. 1. Research Model. Note: line strength of the direct relationships denotes their hypothesized relative strength.

in particular is a limited resource in SMEs (Colombo, Laursen, Magnusson, & Rossi-Lamastra, 2012). Creating internal knowledge through in-house R&D is often prohibitively expensive for SMEs, so they often rely on external knowledge sources (Moilanen et al., 2014). Simultaneously, protecting their internal knowledge from imitation through institutions is vital to SMEs (Maekelburger et al., 2012). Thus, as institutional forces influence how SMEs can protect their internal knowledge and obtain external knowledge, institutions are an important context factor when studying SMEs (Rosenbusch et al., 2011).

Given the above-mentioned complexities, it is presently unclear whether ambidexterity is superior or inferior to a focus on exploration or exploitation in SMEs. A long-held assumption of the field – without restriction to a particular type of firm – is that ambidexterity is superior to a focus on either exploration or exploitation (Tushman & O'Reilly, 1996). However, a newer meta-analysis that integrates primary studies of firms of all sizes finds no support for this assumption (Mathias, 2014). Regarding SMEs, some reviews theorize that ambidexterity may in fact not be superior to exploration and exploitation (O'Reilly & Tushman, 2013; Turner et al., 2013), while other authors suggest the opposite (Lubatkin et al., 2006). Concerning SMEs, the empirical evidence on whether ambidexterity is more beneficial than a focus on exploration or exploitation is also unclear. For example, Bierly and Daly (2007) find that engaging in exploration and exploitation simultaneously does not improve SME performance beyond their singular effects, while McDermott and Prajogo (2012) find that, of exploration, exploitation, and ambidexterity, only the latter consistently improves SME performance.

A related question is under what institutional circumstances exploration and exploitation are particularly beneficial to SMEs. To this end, we examine the moderating role of country-level PRP on the relationships between exploration/exploitation and SME performance. SMEs have limited knowledge resources and, thus, depend on the protection of their internal knowledge and their access to external knowledge. Specifically, the level of PRP (i.e., the existence and reinforcement of laws that safeguard firms' property (Teece, 1986)) in a specific country affects the extent to which firms can profit from exploration and exploitation. Two distinct mechanisms—the prevention of imitation and of knowledge spillovers—are particularly important in the context of SMEs: On the one hand, PRP prevents imitation by increasing the risk of prosecution for unauthorized imitators, leading to higher returns for the original innovator (Teece, 1986). Country-level PRP is particularly vital to SMEs, because they often lack the resources to protect their internal knowledge themselves (Bierly & Daly, 2007). On the other hand, Gangopadhyay and Mondal (2012) demonstrate that PRP also hinders knowledge spillovers (i.e., "external benefits from the creation of knowledge that accrue to parties other than the creator" (Agarwal, Audretsch, & Sarkar, 2007, p. 266)). Similarly, knowledge spillovers occur more frequently in countries in which the PRP system focuses less on protecting innovators and more on diffusing knowledge (W. M. Cohen, Goto, Nagata, Nelson, & Walsh, 2002). This prevention of spillovers is problematic for SMEs because they rely more heavily than larger firms on knowledge spillovers to generate innovation outputs (Acs, Audretsch, & Feldman, 1994).

Fig. 1 summarizes our research model. In the following, we present detailed theoretical rationale to develop our hypotheses.

3. Hypotheses

3.1. *The relative influence of exploration, exploitation, and ambidexterity on SME performance*

We argue that, relative to both exploration and exploitation, ambidexterity yields a lower performance in SMEs. Our argumentation rests on two central considerations: (a) the relative costs of engaging in ambidexterity instead of focusing on either exploration or exploitation are particularly pronounced in SMEs, both when engaging in ambidexterity in two distinct units or within a single unit and (b) the relative benefits of ambidexterity compared to a focus on either exploration or exploitation are limited in SMEs.

The relative costs of engaging in ambidexterity by separating exploration and exploitation into *distinct units* instead of focusing on either exploration or exploitation are especially high for SMEs for two reasons. First, while larger firms are often divided into multiple units due to their sheer size that they can leverage to structurally separate exploration and exploitation (Boumgarden, Nickerson, & Zenger, 2012; Fourné et al., 2019), SMEs would need to invest heavily into creating distinct units specifically to separate exploration and exploitation. The associated costs reduce the performance benefits of ambidexterity.

Second, separating exploration and exploitation into *distinct units* also comes with costly integration challenges for the upper management (Ossenbrink, Hoppmann, & Hoffmann, 2019; Smith & Tushman, 2005), which in turn reduces the performance benefits of ambidexterity in SMEs. Unlike exploration and exploitation, ambidexterity requires managers to be 'consistently inconsistent' (O'Reilly & Tushman, 2004, p. 81) and integrate exploration and exploitation through permanent multitasking (Mom, Van Den Bosch, & Volberda, 2009). Juggling the competing demands of ambidexterity engenders cognitive strain for managers (Keller & Weibler, 2015). As individuals experience greater tensions under resource-scarcity (Miron-Spektor, Ingram, Keller, Smith,

& Lewis, 2018) and SME managers have few routines and information processing systems to support their decision-making (Abebe & Angriawan, 2014; Kiss, Fernhaber, & McDougall-Covin, 2018), this strain is particularly pertinent to SME managers. The resulting stress can reduce decision-making quality (Starcke & Brand, 2016) and, consequently, decrease the performance benefits of ambidexterity in SMEs.

Although some scholars suggest SMEs engage in ambidexterity within a *single unit* to avoid the high costs of structural separation (Lubatkin et al., 2006), SMEs also incur relatively high costs when engaging in this form of ambidexterity for two reasons. First, engaging in ambidexterity within a single unit makes the units' priorities unclear, diluting the employees' sense of direction (Thornhill & White, 2007). Does the firm reward tinkering with novel ideas (i.e., exploration) or following strict procedures to improve efficiency (i.e., exploitation)? Lacking consensus on such fundamental questions engenders communication problems and conflict, decreasing SME performance (Z.G. Voss, Cable, & G.B. Voss, 2006). This problem is particularly pertinent to SMEs because it diminishes one of their key competitive advantages: their rapid internal communication (Vossen, 1998). Instead, engaging in ambidexterity within a single unit prevents SMEs from being internally consistent and focusing on the most profitable part of their portfolio (Van Looy, Martens, & Debackere, 2005; G.B. Voss & Z.G. Voss, 2013).

Second, engaging in ambidexterity within a *single unit* engenders a heavy cognitive strain on all SME employees. In such cases, upper management does not buffer the operational levels from the conflicting demands of ambidexterity (Bledow, Frese, Anderson, Erez, & Farr, 2009). Instead, this strain is placed on *all* SME employees. Just like their managers, SME employees work under resource-scarcity, which intensifies the tensions they experience (Miron-Spektor et al., 2018). The cognitive strain lowers employees' performance (Starcke & Brand, 2016), which in turn detracts from the positive performance implications of ambidexterity.

Ambidexterity also has limited benefits in SMEs. The combined mechanism of ambidexterity fosters firm performance by creating synergies between exploration and exploitation. However, as SMEs have few resources to deploy, the amount of exploration and exploitation that they can engage in is restricted (Cao et al., 2009), limiting the potential synergies through ambidexterity (Jansen, Simsek, & Cao, 2012). Similarly, the balancing mechanism of ambidexterity also has limited performance benefits in SMEs. Both exploration and exploitation are self-enforcing: firms become more competent in exploration or exploitation over time, locking them into either exploration or exploitation (Levinthal & March, 1993). Consequently, Lubatkin et al. (2006) suggest that SMEs benefit from balancing exploration and exploitation. While we agree, we also argue that these benefits are finite as the threats of over-exploration and over-exploitation are negligible in SMEs. In fact, due to SME managers' close involvement in both strategizing and day-to-day operations, they are likely to recognize when their firms are over-exploring or over-exploiting (Lubatkin et al., 2006). Also, SMEs are very flexible and able to adapt to changing needs of their customers and markets (Eggers, 2020; Vossen, 1998), diminishing the potentially negative effects of over-exploration or over-exploitation. Consequently, Tushman and O'Reilly (1996) suggest that particularly the threat of over-focusing on exploitation is less pronounced in smaller firms. Thus, while ambidexterity is beneficial in SMEs, we argue that its benefits are lower compared to a focus on either exploration or exploitation.

In sum, due to the relatively higher costs and the limited benefits of ambidexterity in SMEs, focusing on either exploration or exploitation may be more advantageous for SMEs than engaging in ambidexterity. These considerations lead to the following hypotheses:

H1a: Ambidexterity has a less positive influence on SME performance than exploration.

H1b: Ambidexterity has a less positive influence on SME performance than exploitation.

3.2. The moderating influence of property rights protection

After arguing that SMEs should focus on either exploration or exploitation, we now contextualize these two relationships. We draw on country-level PRP to offer a richer understanding of the boundary conditions under which exploration and exploitation become more or less successful in SMEs.

First, we argue that country-level PRP has limited benefits for the relationship between exploration and SME performance by preventing imitation. In particular, while country-level PRP can potentially prevent imitation of exploration outcomes (Lavie et al., 2010), engagement in the respective property rights system is time-consuming and costly for SMEs. For instance, SMEs often lack dedicated patenting and legal departments (Blind, Edler, Frietsch, & Schmoch, 2006), which may extend the already lengthy patenting process. The ensuing delay is problematic because first-mover advantages make up a cornerstone of exploration success (Mueller et al., 2013). Further, the threat of imitation of exploration outcomes is low for SMEs. Exploration outcomes are often radical and highly innovative and not yet accepted in the market (Mueller et al., 2013). Thus, imitation of exploration outcomes is highly risky for imitators and, therefore, unlikely (Semadeni & Anderson, 2010).

Second, country-level PRP may even have detrimental effects on the relationship between exploration and SME performance by preventing knowledge spillovers. Essentially, exploration enhances firm performance through variation (Levinthal & March, 1993). Access to diverse knowledge enhances firms' chances of finding successful new knowledge combinations (Katila & Ahuja, 2002), making exploration most successful when firms have access to a wide range of external knowledge (Raisch et al., 2009). Indeed, inter-organizational knowledge acquisitions increase firms' radical innovations (Xie, Wang, & Zeng, 2018). However, while larger firms may acquire firms with distant technological backgrounds to foster exploration (Phene, Tallman, & Almeida, 2012), such options are rarely feasible to SMEs. Instead, SMEs rely more heavily on knowledge spillovers from other firms and research facilities (Acs et al., 1994), which proliferate when country-level PRP is low (Acs et al., 2009; Gangopadhyay & Mondal, 2012). Indeed, recent evidence suggests that firms often use knowledge from their successful competitors to improve their own exploration (den Hamer & Frenken, 2020). Consequently, knowledge spillovers are beneficial to the performance implications of exploration in SMEs.

In sum, the relationship between exploration and performance in SMEs benefits from the prevention of imitation through country-level PRP only to a minor extent, while being negatively affected by the necessary time and costs of engaging in respective property rights systems as well as by the prevention of knowledge spillovers. Thus, we hypothesize:

H2a: The performance benefits of exploration in SMEs decrease with the level of PRP in a country.

We now turn to the moderating role of PRP on the relationship between exploitation and SME performance. First, we argue that country-level PRP increases the relationship between exploitation and SME performance by preventing imitation. As SMEs are often highly dependent on specific niches (K. S. Lee et al., 1999), which exploitation cements even further, preventing the imitation of exploitation outcomes is highly important for SMEs. Additionally, as time to market is not key a determinant of exploitation success, the time lag associated with engaging in a sophisticated property rights regime is less problematic for exploitation success than for exploration success. Further, the risk of imitation is particularly strong for exploitation outcomes. When firms engage in exploitation, they follow existing paradigms (Mueller et al., 2013). To competitors, such exploitation outcomes appear reasonable and in tune with the market, as they build on existing knowledge (Abrahamson, 1991; Semadeni & Anderson, 2010). Consequently, imitation of exploitation outcomes is less risky and therefore more likely than that of exploration outcomes (Semadeni & Anderson, 2010).

Table 1
Descriptive Statistics and Correlation Coefficients.

Author(s)	Source[a]	Year	Country	n	Correlation with SME Performance[b]		
					ER	ET	AB
Abebe & Angriawan	JBR	2014	USA	55	0.10	−0.02	
Arzubiaga et al.	RMS	2019	Spain	91	0.49	0.40	
Bierly & Daly	ETP	2007	USA	98	0.25	0.23	
Braumann et al.	WP	2018	Austria	198	0.29	0.27	
Cai et al.	JSBM	2017	China	266	0.38		
Cao et al.	OS	2009	China	122	0.31	0.13	0.22
Chang et al.	MD	2011	UK	265			−0.22
Cui et al.	JIM	2014	USA	135	0.34	0.23	
de Clercq et al.	SBE	2014	Canada	146			−0.05
Fu et al.	JCHRM	2015	China	87	0.51	0.37	0.12
Fu et al.	JPO	2016	Ireland	72	0.17	−0.03	0.21
Günsel et al.	KN	2018	Turkey	105	0.28	0.45	
Heavey & Simsek	JoM	2017	USA	99			−0.01
Kammerlander et al.	JBV	2015	Switzerland	153	0.20	0.20	
Kuckertz et al.	IJTM	2010	Germany	46	0.16	0.30	
Lisboa et al.	JBR	2011	Portugal	262	0.32	0.43	
Lubatkin et al.	JoM	2006	USA	139			0.25
Ou et al.	JoM	2018	USA	105			0.20
Parida et al.	IEMJ	2016	Sweden	187	−0.01	−0.17	−0.14
Patel et al.	AMJ	2013	USA	215	0.22	0.21	0.27
Prajogo et al.	RDM	2013	Australia	180	0.19	0.22	
Ramachandran	DISS	2012	?	233	0.17	0.35	
Ricciardi et al.	JBR	2016	Italy	35	0.32	0.33	
Sirén et al.	SEJ	2012	Finland	206	0.12	0.25	0.07
Sok & O'Cass	JSM	2015	?	150	0.53	0.52	0.26
Solís-Molina et al.	JBR	2018	Columbia	281	0.41	0.46	0.09
Soto-Acosta et al.	JKM	2018	Spain	429			0.29
Stubner et al.	JSBE	2012	Germany	104			0.22
Tran	DISS	2013	USA	82			0.29
Voss et al.	AMJ	2008	USA	163	0.03	0.03	
Vrontis et al.	JTT	2017	Italy	189	0.21	0.27	0.34
Wang	IJIS	2019	Taiwan	135	0.32	0.53	
Yalcinkaya et al.	JIM	2007	USA	111	0.47	0.39	
Yeniaras et al.	IEMJ	2017	Turkey	344	0.44	0.54	

[a] AMJ = Academy of Management Journal; DISS = Dissertation; ETP = Entrepreneurship Theory and Practice; IEMJ = International Entrepreneurship and Management Journal; IJIS = International Journal of Innovation Science; IJTM = International Journal of Technology Management; JBR = Journal of Business Research; JBV = Journal of Business Venturing; JCHRM = Journal of Chinese Human Resource Management; JIM = Journal of International Marketing; JKM = Journal of Knowledge Management; JoM = Journal of Management; JPO = Journal of Professions and Organization; JSM = Journal of Services Marketing; JSBE = Journal of Small Business and Entrepreneurship; JSBM = Journal of Small Business Management; JTT = The Journal of Technology Transfer; KN = Kybernetes; MD = Management Decision; OS = Organization Science; RDM = R&D Management; RMS = Review of Managerial Science; SBE = Small Business Economics; SEJ = Strategic Entrepreneurship Journal; WP = Working Paper

[b] ER = Exploration; ET = Exploitation; AB = Ambidexterity.

Second, the prevention of knowledge spillovers through country-level PRP systems is less relevant for the relationship between exploitation and SME performance because of the negligible effect of knowledge spillovers on exploitation success. In contrast to exploration, successful exploitation does not require diverse external knowledge. Instead, exploiting SMEs benefit more from their experience with existing markets and knowledge (Ko & Liu, 2019), making knowledge spillovers less relevant.

In sum, the prevention of imitation through country-level PRP systems has a positive effect on the relationship between exploitation and SME performance, whereas the prevention of knowledge spillovers has a negligible effect on the direct relationship. Thus, we hypothesize:

H2b: The performance benefits of exploitation in SMEs increase with the level of PRP in a country.

4. Methods

4.1. Literature search and study inclusion

We used meta-analysis to quantitatively synthesize extant research and test our hypotheses. We conducted an extensive systematic literature search to identify relevant studies. First, we searched the EconLit, Business Source Premier, Web of Science, and Scopus databases using various keyword combinations and variations (e.g., exploration, exploitation, explorative, exploitative, ambidexterity, ambidextrous, SME, small firm, performance). Second, we manually searched the top journals of the field as identified by Birkinshaw and Gupta (2013): *Academy of Management Journal*, *Administrative Science Quarterly*, *Industrial and Corporate Change*, *Journal of Management*, *Journal of Management Studies, Management Science, Organization Science* and *Strategic Management Journal*[1]. We supplemented this list by a search in high quality journals which regularly publish articles on SMEs (i.e., *Entrepreneurship Theory and Practice, Journal of Business Venturing, Journal of Business Research, Journal of Small Business Management, Small Business Economics, Strategic Entrepreneurship Journal*), and on technology and innovation (i.e., *Research Policy, Journal of Product Innovation Management*). We began our manual search in 2000 as the first quantitative study of the field was published in that year (Junni et al., 2013). Third, we searched for dissertations in ProQuest. Fourth, we checked the references of meta-analyses on exploration, exploitation, and ambidexterity (Enke & Bausch, 2013; Fourné et al., 2019; Junni et al., 2013; Mathias, 2014; Mathias et al., 2018; Mueller et al., 2013; Shi et al., 2020) and related literature reviews (e.g., Birkinshaw & Gupta, 2013; Lavie et al., 2010; Raisch & Birkinshaw, 2008). Finally, we conducted an

[1] We excluded the Academy of Management Review as it does not publish quantitative studies.

unstructured search of Google and GoogleScholar (Cooper, 1998), making use of forward citations to identify further relevant literature. We completed our search in July 2019.

For our analysis, we extracted multiple data points from the identified primary studies: the operationalization of key constructs, the correlation coefficients, the sample size, the size of the sampled firms in terms of number of employees, the year(s) of data collection (or, if unavailable, the publication year) and the country of data collection. In the case of unclear information, we sought clarification from the corresponding authors.

We eliminated studies for three reasons. First, we excluded studies clearly not related to firm-level exploration, exploitation, and/or ambidexterity as conceptualized above. For example, we excluded Snell, Sok, and Danaher (2015) because they focused on growth/quality of work life ambidexterity and Kilpi, Lorentz, Solakivi, and Malmsten (2018) because their unit of analysis was SMEs' purchasing and supply chain departments rather than the entire firm. Second, we excluded studies that did not focus on SMEs (i.e., firms with 500 employees or less; OECD, 2005). Third, we eliminated studies that did not include the necessary statistical information such as qualitative studies, reviews, and conceptual work (Fourné et al., 2019).

Applying all three criteria led to 116 potentially eligible studies. Of these, we had to exclude 82 studies. First, we made sure that our sample studies used measures consistent with our definitions of the key variables in order to increase the validity of our meta-analytical findings (Lipsey & Wilson, 2001). More specifically, we excluded 37 studies that did not align with our definitions of exploration, exploitation, and/or ambidexterity according to two independent raters. We obtained an excellent interrater-reliability (i.e., Cohen's Kappa) of 0.86 (J. Cohen, 1960). We resolved the discrepancies through discussion. Consistent with our definition, ambidexterity had to consist of a combination of two separate exploration and exploitation measures. Thus, instead of coding whether an ambidexterity measure fits our definition, we ensured that both the exploration and the exploitation measure were in line with our definition. We also removed 33 studies that did not measure overall SME performance but instead constructs such as new product development performance (e.g., Mu, 2015) or export performance (e.g., Ribau, Moreira, & Raposo, 2019). We excluded four studies because they did not use distinct measures for exploration and exploitation, but rather a continuous measure.[2] We excluded eight studies with overlapping or identical samples to avoid bias through the over-representation of certain firms in our meta-analytical sample (Fourné et al., 2019). In these cases, we retained the study with the largest amount of high-quality information (e.g., information on a larger number of our focal relationships). Our final sample encompasses 34 studies including a total of 5,488 SME observations as displayed in Table 1.

4.2. Measures and coding

Based on our definition of exploration and exploitation, we included measures such as exploration and exploitation orientation (e.g., Lubatkin et al., 2006), adaptability (i.e., exploration) and alignment (i.e., exploitation) (e.g., De Clercq et al., 2014), and exploration and exploitation strategies (e.g., Bierly & Daly, 2007). Sample items for exploration were 'we frequently experiment with radical new ideas (or ways of doing things)' (Bierly & Daly, 2007, p. 511) and '[our firm] actively targets new customer groups' (Lubatkin et al., 2006, p. 656), while sample items for exploitation were 'our company excels at refining existing technologies' (Bierly & Daly, 2007, p. 512) and '[our firm] penetrates more deeply into its existing customer base' (Lubatkin et al., 2006, p. 656).

Performance is a multi-dimensional construct (Combs, Crook, & Shook, 2005). Thus, we included multiple measures of SME performance (i.e., growth, financial, and aggregate measures) to limit the risk of obtaining biased results because of the performance indicator selected (Raisch & Birkinshaw, 2008).

We assessed PRP by coding the property rights dimension of the Index of Economic Freedom (The Heritage Foundation) which assesses a country's extent and enforcement of laws protecting private property. We extracted the PRP value for the primary studies based on the country of the study and the data collection year(s). If unspecified, we assumed that data collection took place three years prior to publication (Schlaegel & Koenig, 2014). If the authors did not specify the country of data collection, we excluded the study from the moderator analysis. Our moderator analysis covered studies from 15 countries.

Before conducting the meta-analysis, we ensured that our data were comparable. We averaged the effect sizes when studies included multiple measures of the focal constructs (Mathias et al., 2018). While a large value on the ambidexterity scale generally indicates a high level of ambidexterity (e.g., Cao et al., 2009), a small number of studies used a reversed measure to indicate ambidexterity (e.g., Fu, Ma, Bosak, & Flood, 2015). We reversed the signs of the respective correlations, so that higher values consistently indicate higher levels of ambidexterity. Next, to stabilize the variance of the effect sizes, we applied Fisher's r-to-z-transformation to the correlations (Hedges & Olkin, 1985).

4.3. Analytical procedure

We used the Hedges and Olkin (1985) procedure to conduct a random-effects meta-analysis. As studies with larger samples are more precise, we weighted each study with the inverse of its variance (Hedges & Vevea, 1998). To determine the level of heterogeneity in the effect size distribution, we used the Q-Statistic (Hedges & Olkin, 1985). We conducted the analysis in Stata using the Wilson (2016) meta-analytical macros.

We compared the relative sizes of the meta-analytical correlations between exploration, exploitation, ambidexterity, and SME performance. Since all three independent variables (i.e., exploration, exploitation, and ambidexterity) share the same dependent variable (i.e., SME performance), we considered them dependent and took the correlations between the different independent variables into consideration when comparing the relationships (Q. Wang, Bowling, & Eschleman, 2010). In particular, to account for this dependence, we use the Steiger (1980) z-test and the Zou (2007) confidence interval procedure to compare the correlations (Schlaegel & Koenig, 2014). In Steiger's z-test, a significant z-value suggests that the size of the correlations is significantly different. Analogously, Zou's confidence interval procedure suggests that the correlations are significantly different if the calculated confidence interval does not include zero. In both tests, we used the harmonic mean of the total sample sizes of the relevant correlations as the sample size, as this limits the upward pull of very large values on the mean (Bergh et al., 2016). We used the Diedenhofen and Musch (2015) cocor software package to perform the tests on the back-transformed (z-to-r) correlation coefficients.

To investigate moderation effects, we employed meta-analytic regression analysis using a random-effects model. In particular, we conducted weighted least squares regression using inverse variance weights to estimate the influence of the continuous moderator (i.e., PRP) on the direct relationships (Lipsey & Wilson, 2001). Further, we computed the Q_M index, which assesses the portion of variability that the moderator explains in the model (Lipsey & Wilson, 2001). A significant Q_M indicates that the moderator reduces variability, improving the overall model.

[2] Continuous measures refer to scales that use exploration and exploitation as two ends of a continuum. As we conceptualize exploration and exploitation as distinct variables and argue that lower exploration does not necessarily increase exploitation and vice versa, we do not use continuous measures. In contrast, we do include subtractive scores, which calculate ambidexterity by measuring the difference between two independently measured exploration and exploitation scales.

Table 2
Tests for Publication Bias.

		Trim and Fill				Egger		B&M	Orwin
Variable	k	ik	$r_{t\&f}$	95% $CI_{t\&f}$		Δr	B_0	$p(B_0)$	$p(\tau)$	FSN
Exploration	26	0	0.30	0.27	0.33	0.00	−0.61	0.69	0.90	68
Exploitation	25	0	0.32	0.29	0.35	0.00	−2.65	0.18	0.32	66
Ambidexterity	17	2	0.12	0.08	0.15	0.02	0.41	0.87	0.62	13

k = number of sample studies; ik = number of trim & fill imputed studies; $r_{t\&f}$ = trim & fill adjusted, mean observed z-transformed correlation (fixed-effects model); 95% $CI_{t\&f}$ = trim and fill-adjusted 95% confidence interval; Δr = difference between weighted mean correlation (fixed-effects model) and trim & fill adjusted weighted mean observed correlation (fixed-effects model); B_0 = Egger's intercept; $p(B_0)$ = significance of Egger's intercept; $p(\tau)$ = significance of Kendall's tau; FSN = Orwin's Fail-Safe N

Table 3
Relationships with SME Performance.

Variable	k	N	*r*	95% CI		z	Q
Exploration	26	4119	0.29***	0.23	0.34	9.24	95.87***
Exploitation	25	3853	0.29***	0.21	0.36	7.09	150.34***
Ambidexterity	17	2878	0.14**	0.05	0.23	3.11	90.16***

k = number of sample studies; N = total number of SME observations, *r* = weighted mean observed correlation, back-transformed from Fisher's z-transformation (random-effects model); 95% CI = 95% confidence interval; z = z-value; Q = heterogeneity
*p < 0.05; **p < 0.01; ***p < 0.001

5. Results

5.1. Publication bias

Prior to testing the hypotheses, we checked for publication bias. Such bias, which occurs if studies with non-significant or counterintuitive results are less frequently published, may impair the validity of meta-analytical findings (Kepes, Banks, McDaniel, & Whetzel, 2012). To detect publication bias, Ferguson and Brannick (2012) suggest a tandem approach of four tests: the Duval and Tweedie (2000) trim-and-fill method, the Orwin (1983) fail-safe N, the Egger, Smith, Schneider, and Minder (1997) regression test, as well as the Begg and Mazumdar (1994) rank order correlation test. The tandem approach minimizes Type I error by considering publication bias as problematic only if the trim-and-fill method, the fail-safe N and either the regression test or the rank order correlation test point toward it (Ferguson & Brannick, 2012).

The trim-and-fill method calculates the number of studies necessary to achieve funnel plot symmetry (Duval & Tweedie, 2000). Without publication bias, the funnel plot (i.e., the scatterplot between the sample sizes and the effect size of the sample studies) is symmetrical: larger, more precise studies cluster narrowly around the average effect size towards the top of the plot, while smaller, less precise studies spread around the average effect size across a broader range. The trim-and-fill method iteratively "trims" data points from one side of the funnel and "fills" the other side with these data points until the plot becomes symmetrical. We followed recommendations and estimate the test using a more conservative fixed-effects model (Duval, 2005). Next, the Orwin (1983) fail-safe N computes the number of studies with null-effects necessary to reduce the overall effect size to a trivial size (i.e., one third of the average effect size (Subramony, 2009)). A fail-safe N smaller than the number of samples indicates publication bias (Ferguson & Brannick, 2012). The Egger et al. (1997) test regresses the standardized effect size on its precision. The regression line runs through the origin if there is no bias (Kepes et al., 2012). Finally, the Begg and Mazumdar (1994) test assesses whether the effect size and its standard error are independent using rank-order correlation. As publication bias tends to affect especially smaller sample studies, a significant inverse rank-order correlation (i.e., Kendall's tau) provides evidence of bias (Kepes et al., 2012).

Table 2 illustrates the results of the four mentioned publication bias tests. The only hints of publication bias stem from the trim and fill method and Orwin's fail-safe N in the relationship between ambidexterity and SME performance. Therefore, following the tandem approach, publication bias is unlikely to distort our findings (Ferguson & Brannick, 2012).

5.2. Direct relationships

Table 3 shows the weighted, back-transformed (from Fisher's z units) meta-analytical correlation coefficients (*r*) between exploration, exploitation, ambidexterity, and SME performance. The relationships of exploration ($r = 0.29$, $p < 0.001$), exploitation ($r = 0.29$, $p < 0.001$), and ambidexterity ($r = 0.14$, $p < 0.01$) with SME performance are all positive and significant. Further, the significant Q-Statistics indicate heterogeneity in the relationships, warranting a moderator analysis (Lipsey & Wilson, 2001).

To test hypotheses 1a and 1b, we compared the relative sizes of the meta-analytic correlation coefficient (*r*) between exploration, exploitation, ambidexterity, and SME performance. First, consistent with hypothesis 1a, the relationship of exploration and SME performance is significantly larger than that of ambidexterity and SME performance (Steiger's z = 4.87, $p < 0.001$; Zou's 95% CI: 0.09 to 0.20). Second, supporting hypothesis 1b, the relationship of exploitation with SME performance is significantly larger than that of ambidexterity with SME performance (Steiger's z = 4.75, $p < 0.001$; Zou's 95% CI: 0.09 to 0.21).

5.3. Moderating influence of PRP

Finally, Table 4 illustrates the results of the moderator analysis. Consistent with hypothesis 2a, our findings show a significant negative moderating influence of PRP on the relationship between exploration and SME performance (ß = −0.004, $p < 0.001$). Hence, exploration is particularly beneficial to SMEs in countries with lower PRP.

Table 4
Moderator Analysis.

Variable		Moderator	k	ß	SE	95% CI	Q_M
Dependent Variable: Performance							
H2a	Exploration	PRP	24	−0.004***	0.001	−0.006 to −0.002	12.60***
H2b	Exploitation	PRP	23	−0.004**	0.002	−0.008 to −0.001	6.69**

k = number of sample studies; ß = beta coefficient; SE = standard error; 95% CI = 95% confidence interval; Q_M = heterogeneity of the model; PRP = Property Rights Protection
*p < 0.05; **p < 0.01; ***p < 0.001

Contradicting hypothesis 2b, we find a negative moderating influence of PRP on the relationship between exploitation and SME performance (ß = −0.004, $p < 0.01$), which means that the benefits of exploitation in fact decrease with greater levels of PRP.

5.4. Post hoc tests

We conducted two post hoc tests. First, to ensure that outliers do not skew our results, we reanalyzed our data excluding outlier studies. To this end, we followed the procedure by Viechtbauer and Cheung (2010) using the metafor package for R (Viechtbauer, 2010). Second, while we include unpublished work to lower the threat of publication bias (Mueller et al., 2013), evidence from published sources is considered to be more validated (Podsakoff, MacKenzie, Bachrach, & Podsakoff, 2005). Consequently, we reran our analyses without working papers and dissertations. The results of both post hoc tests are consistent with the reported results.

6. Discussion

This study investigates the relative relationships of exploration, exploitation, and ambidexterity with SME performance by means of meta-analysis. As theorized, we find that ambidexterity has inferior performance benefits compared to exploration and exploitation in SMEs. Further, in line with our theorizing, we find a significant negative moderating influence of the level of PRP on the relationship between exploration and SME performance. However, in contrast to our theoretical expectations, exploitation is also less advantageous to SMEs under higher levels of PRP.

Our findings underscore that SMEs are distinct from larger firms and that it is necessary to adapt theorizing from larger firms to SMEs' unique characteristics. In contrast to our findings, a prior meta-analysis on firms of all sizes finds no significant difference between the effect sizes of the relationships between exploration, exploitation, as well as ambidexterity and performance (Mathias, 2014). These diverging results suggest that extant theorizing does not necessarily apply to SMEs (Shuman & Seeger, 1986). However, not all primary studies drawing on SME samples explicitly acknowledge SMEs' unique characteristics in their theory building (for exceptions, see Kammerlander, Burger, Fust, & Fueglistaller, 2015; Lubatkin et al., 2006). Building on our findings, research should explicitly link the underlying theorizing to the type of firms under examination.

Our study extends existing theorizing and reduces inconclusive empirical results regarding the relative benefits of ambidexterity in SMEs. While beneficial to SMEs, the positive relationship of ambidexterity with SME performance is significantly smaller than that of exploration or exploitation. This finding substantiates warnings against the presumed superiority of ambidexterity, particularly in SMEs (Solís-Molina, Hernández-Espallardo, & Rodríguez-Orejuela, 2018; Turner et al., 2013). Our argument that SMEs lack sufficient resources to achieve superior performance through ambidexterity compared to focusing on either exploration or exploitation is consistent with primary evidence suggesting that limited resources make ambidexterity less beneficial (e.g., Jansen et al., 2012). Consequently, our work contributes to the idea that ambidexterity is not a panacea and that for some firms – such as SMEs – focusing is more valuable.

The presented meta-analytical evidence also contributes to a clearer understanding of what SMEs should focus on. While past research provides recommendations on how SMEs can achieve ambidexterity despite the associated challenges (e.g., Heavey & Simsek, 2017; Lubatkin et al., 2006), our study suggests that this effort is not necessarily required to achieve superior performance. Instead, we recommend that SMEs focus on exploration or exploitation, aligning their firms entirely toward one or the other. Such an alignment is particularly important in SMEs as exploration and exploitation require different structures to be successful (Koryak et al., 2018) and, unlike larger firms, SMEs usually do not have the resources to create separate units for exploration and exploitation. Consequently, exploring SMEs should foster entrepreneurial orientation (Abebe & Angriawan, 2014) and increase their technological resources (Yalcinkaya, Calantone, & Griffith, 2007). Further, it is advantageous to such firms if their CEO has a low prevention focus (i.e., a low desire to avoid failures) (Kammerlander et al., 2015). In contrast, exploiting SMEs should increase their marketing resources (Yalcinkaya et al., 2007) and emphasize formalization (Prajogo & McDermott, 2014). In such firms, a written vision allows leadership to rally their employees around the execution of the firm's exploitation goals (Koryak et al., 2018).

While our research focuses on the tension between exploration and exploitation, our theorizing may also contribute to discussions of tensions in other domains (Ricciardi, Zardini, & Rossignoli, 2016; Smith, 2014). Such tensions arise between global integration and local adaption (Marquis & Battilana, 2009), profitability and social impact (Margolis & Walsh, 2003), or cooperation and competition (Hoffmann, Lavie, Reuer, & Shipilov, 2018). In this regard, our study adds weight to research suggesting that tensions manifest particularly strongly in SMEs and that such firms should maintain a consistent strategic focus instead of attempting to pursue too many competing strategies simultaneously (Ebben & Johnson, 2005).

Although our findings indicate that ambidexterity is less beneficial for SME performance than a focus on either exploration or exploitation, we do not necessarily recommend that SMEs should permanently either explore or exploit. Instead, our theorizing and findings simply suggest that doing both *simultaneously* (i.e., engaging in ambidexterity) is inferior to focusing in SMEs. However, *sequential* switching between exploration and exploitation may represent a viable alternative to ambidexterity for SMEs (Parida, Lahti, & Wincent, 2016) as it allows such firms to remain internally consistent.[3] The notion that firms may sequentially switch between phases of exploration and exploitation stems from punctuated equilibrium, which suggests that firms cycle through long periods of incremental change punctuated by short bursts of radical change (Tushman & Romanelli, 1985).

As the cross-sectional nature of our sample studies prevents us from examining sequential switching within our meta-analysis, if and when SMEs should switch between exploration and exploitation remain important questions for future longitudinal research. Evidence from firms of all sizes highlights the merit of sequential switching (Mudambi & Swift, 2011, 2014), but it is presently unclear if these benefits extend to resource-constrained SMEs. Sequential switching engenders greater complexity than consistently focusing on either exploration or exploitation due to the challenging transition phase (Lavie et al., 2010; Mavroudi et al., 2020), which affects both the optimal frequency and speed of switching. Consequently, it is unsurprising that switching at a higher frequency generally has negative performance implications (Mavroudi et al., 2020). Frequent switches are especially difficult to manage for resource-constrained firms (Mudambi & Swift, 2011). However, as the life-cycle stages of SMEs' markets or products change over time, such firms may need to switch between exploration and exploitation despite the associated challenges. Hence, future research may examine how frequently and under what circumstances SMEs should switch between exploration and exploitation for optimal performance. Regarding the speed of switiching, transitioning slowly between exploration and exploitation rather than abruptly switching from one to the other is particularly beneficial to firms with fewer resources (Kang & Kim, 2020). Here, scholars should examine whether slower transitions are always preferable for SMEs or whether, for instance, start-ups benefit from fast pivots. Finally, we lack an understanding of what resources

[3] While some scholars view sequential switching as a form of ambidexterity (e.g., Simsek, Heavey, Veiga, & Souder, 2009), we follow the narrower definition of ambidexterity as engaging in exploration and exploitation *simultaneously* and not sequentially (Gupta, Smith, & Shalley, 2006; Ossenbrink et al., 2019).

specifically SMEs need to successfully manage transitions between exploration and exploitation.

We now turn to the unique role SME leadership plays when SMEs switch between exploration and exploitation. One of the key challenges in successfully switching is recognizing the need to switch (Boumgarden et al., 2012; Lavie et al., 2010). In line with our prior argumentation in section 3.1 that SMEs are unlikely to over-exploit or over-explore, we suggest that the involvement of SME leadership in both strategic and operational tasks as well as their heightened awareness of environmental changes (Eggers, 2020; Lubatkin et al., 2006) make it easier for them to recognize the need to switch. Here, it would be interesting to understand what exactly alerts SME leaders of the need to switch. Conversely, SME leadership may need to manage both exploration and exploitation phases because, in contrast to larger firms (Boumgarden et al., 2012), SMEs are less likely to change leadership when they switch between exploration and exploitation. Here, future research should examine what leadership competencies are required for SME leaders to successfully manage both exploration and exploitation phases.

In the second part of our meta-analysis, we turned to PRP as an important environmental-level moderator of the relationships between exploration, exploitation, and SME performance. Our theorizing accounts for the two mechanisms of PRP that are particularly relevant in the SME context: the prevention of imitation and of knowledge spillovers. We find that country-level PRP negatively moderates the relationship between exploration and SME performance, even though large parts of the literature on PRP emphasize the positive effects of PRP (Teece, 1986). While we do not dispute that SMEs benefit from PRP through preventing imitation, our findings underscore the need to look beyond the positive side of PRP and also consider the prevention of knowledge spillovers. In particular, the detrimental effect of the prevention of knowledge spillovers on the benefits of exploration in SMEs is in line with recent work illustrating that firms engaging in exploration often draw on the knowledge of their successful competitors (den Hamer & Frenken, 2020).

The central role of knowledge spillovers in exploration success has important implications for SME research. For example, SMEs may intensify their efforts to gain knowledge through other means in countries with lower levels of knowledge spillovers. In particular, SMEs can draw on knowledge from trade organizations, networks, open innovation, and research collaborations (Lin & Lin, 2016; Moilanen et al., 2014; Singh, Gupta, Busso, & Kamboj, 2019). Future research should examine how SMEs can leverage these knowledge sources to improve exploration's performance implications. Also, it is unclear what types of knowledge (beyond technologically distant knowledge (Bierly, Damanpour, & Santoro, 2009)) are particularly beneficial for exploration success. For instance, we know little about how market and managerial knowledge influence SMEs' exploration success.

Interestingly, we find that exploitation is also less successful in countries with higher levels of PRP, indicating that SMEs may not rely as heavily on PRP to prevent the imitation of their exploitation outcomes as expected. Indeed, due to the costs associated with the property rights system, SMEs often use informal methods such as creating high trust relationships to protect their intellectual property (Kitching & Blackburn, 1998). Such informal methods of PRP are especially promising when firms engage in repeated interactions, because rational decision making dictates that they abstain from antagonizing long-term partners (Lanjouw & Schankerman, 2004). Since exploiting SMEs often continue to collaborate with existing partners and suppliers, informal methods of protection may be particularly beneficial to them and formal PRP relatively less valuable. However, two reasons related to the prevention of knowledge spillovers through PRP might also be behind the detrimental effect of PRP on the relationship between exploitation and SME performance. First, knowledge spillovers may not only be useful for exploration, but also play a larger role than expected for exploitation. SMEs may draw on knowledge spillovers to refine their current products or further penetrate existing markets. Second, when larger firms with extensive property rights expertise engage in behaviors that undermine knowledge spillovers such as stacking licenses (Heller & Eisenberg, 1998) or building patent walls (Blind, Cremers, & Mueller, 2009), exploiting SMEs may especially suffer as such behaviors affect their core niche. Consequently, especially for SMEs, the negative side of PRP seems to outweigh the benefits of prevention of imitation.

As we suggest in our paper, SMEs are highly sensitive to environmental-level contingencies, making it meaningful for future research to go beyond PRP and examine other environmental contingencies of the relationships between exploration, exploitation, and ambidexterity with SME performance. In particular, as the environment shapes SMEs' access to (knowledge) resources (Cao et al., 2009; Osiyevskyy, Shirokova, & Ritala, 2020), we recommend that scholars continue to delve deeper into this domain. For example, in developing countries, it may be especially difficult for SMEs to gain access to the specific resources that make exploration, exploitation, or ambidexterity endeavors a success. Future research should also examine how SMEs can reduce their sensitivity to their environment by leveraging cross-industry and international alliances if their own environment is unfavorable to their exploration, exploitation, and/or ambidexterity efforts.

Future SME research may also examine the firm-level contingencies of the direct relationships more extensively. As we argue in this study, limited resources make it difficult for SMEs to benefit from ambidexterity. Consequently, examining firms' resources is particularly relevant to SME research. Extant research has made some headway in this domain. For example, in SMEs with higher levels of cognitive resources (i.e., absorptive capacity), the benefits of ambidexterity outweigh those of exploration or exploitation (Solís-Molina et al., 2018). Similarly, the extent to which SMEs' resources decrease following a crisis moderates the performance implications of exploration and exploitation in such firms (Osiyevskyy et al., 2020). However, we know little about which specific resources are comparatively more or less important for successful exploration, exploitation, and ambidexterity in SMEs. Consequently, we recommend examining how different types of resources (e.g., financial, operational, customer relational, or human resources (G. B. Voss, Sirdeshmukh, & Voss, 2008) or scale-free and non-scale-free resources (Kang & Kim, 2020)) influence the direct relationships specifically in SMEs. Further, additional inquiry into how SMEs can best deploy their limited resources may be beneficial. For example, as bricolage (i.e., problem solving with the resources at hand) allows innovating firms to deal with resource scarcity (Witell et al., 2017), SMEs may utilize bricolage to improve the performance implications of their ambidexterity efforts.

While our meta-analysis makes an important step forward in tailoring theorizing specifically to SMEs, future research should also account for firm-level heterogeneity within this group of firms. For example, family firms utilize different resources when engaging in exploration, exploitation, or ambidexterity than non-family firms (Goel & Jones III, 2016). Similarly, while start-ups likely benefit most from exploration, exploitation may be superior in more established SMEs (Kammerlander et al., 2015). However, it is yet unclear if the benefits of exploration, exploitation, and ambidexterity change over SMEs' lifecycle stages.

Finally, we turn to individual-level moderators of the direct relationships as a domain for further scholarly inquiry. In this regard, the characteristics of SMEs' upper management are very important given their particularly influential position in SMEs (Kammerlander et al., 2015). While we argue that ambidexterity is especially challenging for SMEs' managers, viewing the associated tensions positively as energizing rather than negatively may make it easier for SME managers to work with these tensions (Miron-Spektor et al., 2018; Papachroni & Heracleous, 2020). Also, SME managers may alleviate the stress of ambidexterity by building specific routines and processes to allow them to integrate their firms' exploration and exploitation efforts more easily. Further, employees' individual-level explorative, exploitative, and ambidextrous activities are particularly important because, as we

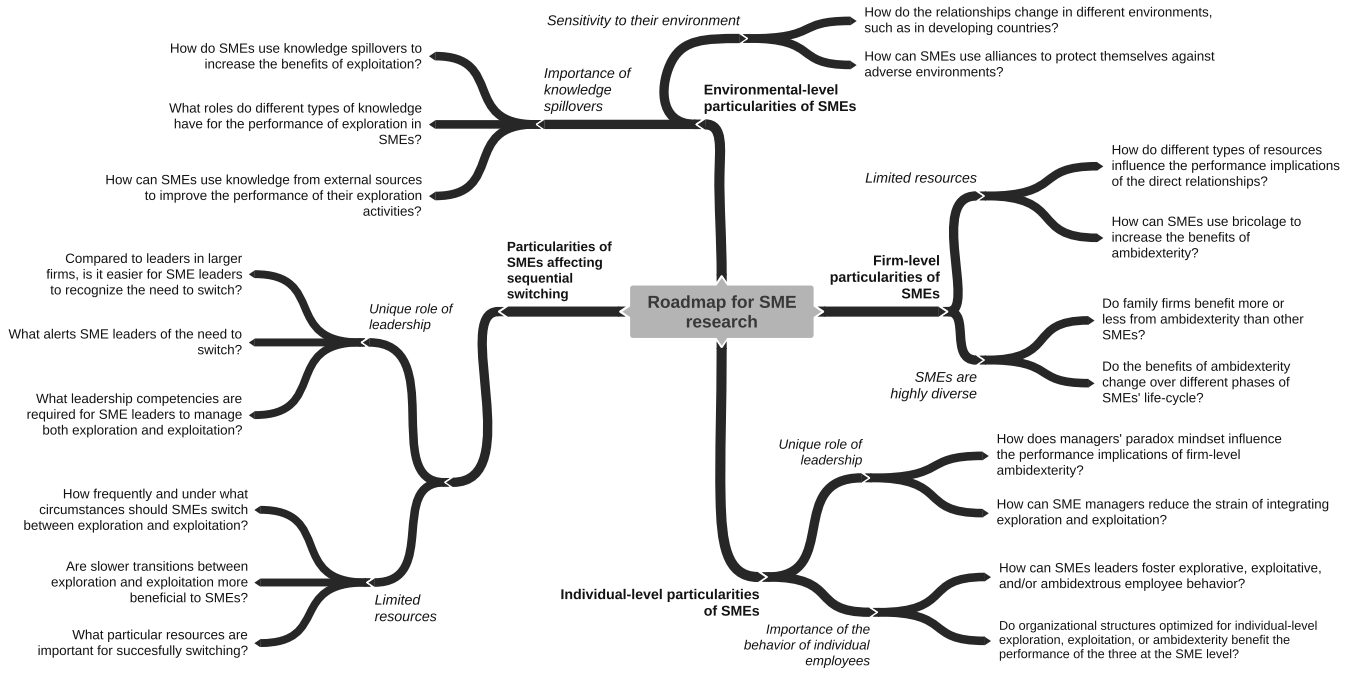

Fig. 2. Roadmap for Future Research.

argued before, SMEs have few formal systems and routines constraining employees' activities (Kiss et al., 2018; Vossen, 1998). Consequently, research on SMEs should examine whether fostering explorative, exploitative, and ambidextrous behavior in SME employees, for example, through supportive leadership (Kauppila & Tempelaar, 2016) or by adapting organizational structures (e.g., S. Lee, 2019), improves the performance of firm-level exploration, exploitation, and ambidexterity.

In conclusion, our meta-analysis of the current research on the performance implications of exploration, exploitation, and ambidexterity in SMEs and the in-depth discussion of our findings culminates in a systematic roadmap for future research in this domain. First, as our meta-analysis indicates that ambidexterity is not as beneficial for SMEs as engaging in exploration or exploitation, we suggest examining sequential switching between exploration and exploitation as the natural next step for future research building on our insights. Second, our findings on the moderating role of PRP suggests that contextual factors matter for the success of exploration, exploitation, and ambidexterity efforts. In turn, there is still much to be learned about additional environmental-, firm-, and individual-level moderators in SMEs, leading us to develop avenues for future research in this domain. Fig. 2 illustrates the roadmap for future scholarly inquiry using the software Coggle.

7. Limitations and concluding remarks

Our study is not without limitations. First, the cross-sectional nature of most of the sample studies merits consideration when making causal inferences. Further, our study suggests that focusing on exploration or exploitation is more beneficial for SME performance than engaging in ambidexterity. Unfortunately, the cross-sectional nature of the majority of our sample studies does not allow for investigating whether it is more beneficial to SMEs to focus on exploration or exploitation over the long-term, or if they should sequentially switch between the two. However, we address sequential switching in our discussion section and offer several related avenues for future research. Second, none of the primary studies in our sample considers survival as an outcome variable. This limitation carries over to our meta-analysis (Mueller et al., 2013). We encourage future research to examine the survival implications of exploration, exploitation, and ambidexterity in SMEs because the threat of failure is particularly high to SMEs. Third, while using aggregated performance measures when examining exploration, exploitation, and ambidexterity limits the risk of biased results (Raisch & Birkinshaw, 2008) and is particularly valid when studying SMEs (Jacobs & Cambré, 2020), past research demonstrates that the type of performance measure examined may influence the direct relationships (Auh & Menguc, 2005; Junni et al., 2013). Unfortunately, the primary studies in our sample predominately employ aggregated measures, limiting our ability to differentiate between types of performance. Consequently, future research may delve deeper into how exploration, exploitation, and ambidexterity relatively influence the different types of SME performance (e.g., growth vs. profit). Fourth, similar to a prior meta-analysis (Mueller et al., 2013), our study accounts only for linear relationships despite indications that the direct relationships may be non-linear (Bierly & Daly, 2007; Mueller et al., 2013). Fifth, while the international focus of SMEs is usually limited compared to larger firms (Schwens, Zapkau, Brouthers, & Hollender, 2018), some SMEs may operate in international markets and, therefore, are affected by the PRP levels not only of their home countries, but also by those of the foreign host countries in which they do business.

To conclude more generally, our findings underscore the necessity of a fine-grained understanding of exploration, exploitation, and ambidexterity in specific contexts. In particular, our findings indicate that (a) results from larger firms do not necessarily apply to SMEs, (b) ambidexterity is less beneficial to SMEs than focusing on exploration or exploitation, and (c) a nuanced view of the role of PRP on the effects of exploration and exploitation on SME performance is warranted. Finally, based on our discussion of the above findings, we develop a roadmap for future research to spur further scholarly inquiry into this promising domain.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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